UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

February 21, 2003

Thomas F. Mueller
Department of the Army
Seattle District Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Biological Opinion and Essential Fish Habitat Consultation for the Leslie Groves Park and Howard Amon Park Boat Launch Facilities Improvement Project, Benton County, Washington, WRIA 37 (NOAA Fisheries # 2002/00604).

Dear Mr. Mueller:

The attached document transmits the National Oceanic and Atmospheric Administration (NOAA) Fisheries Biological Opinion (Opinion) on the proposed Leslie Groves Park and Howard Amon Park Boat Launch Facilities Improvement Project in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531).

The U.S. Army Corps of Engineers (COE) has determined that the proposed action was not likely to adversely affect Upper Columbia River (UCR) spring-run chinook (*Oncorhynchus tshawytscha*) and Upper Columbia River (UCR) steelhead (*O. mykiss*) Evolutionary Significant Units. Formal consultation was initiated on November 21, 2002.

This Opinion reflects formal consultation and an analysis of effects covering the above listed species in the Columbia River above McNary Dam and below Priest Rapids Dam, Washington. The Opinion is based on information provided in the biological assessment received by NOAA Fisheries on June 10, 2002, subsequent information transmitted by telephone conversations and electronic mail. A complete administrative record of this consultation is on file at the Washington State Habitat Branch Office.

NOAA Fisheries concludes that the implementation of the proposed project is not likely to jeopardize the continued existence of the above listed species. Please note that the incidental take statement, which includes reasonable and prudent measures and terms and conditions, was designed to minimize take. If you have any questions, please contact Justin Yeager of the Washington State Habitat Branch Office at (509) 925-2618.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation

Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat Consultation

City of Richland Proposed Boat Launch Facilities Improvement Projects on the Leslie Groves Park and Howard Amon Park Properties, Benton County, Washington

NOAA Fisheries #2002/00604

Agency: U.S. Army Corps of Engineers

Consultation Conducted By: NOAA Fisheries, Northwest Region, Washington Habitat Branch

Issued by: For Michael R Crouse

D. Robert Lohn
Regional Administrator

Date Issued: February 21, 2003

TABLE OF CONTENTS

1.0 INTRODUCTION

This document is the product of an Endangered Species Act (ESA) section 7 formal consultation and Magnuson-Stevens Fishery Conservation and Management Act (MSA) Essential Fish Habitat (EFH) consultation between the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the U.S. Army Corps of Engineers (COE) for the proposed boat launch facility projects on the Leslie Groves Park and Howard Amon Park properties in Benton County, Washington. The proposed action will occur within the geographic boundaries and habitats of two Evolutionarily Significant Units (ESU[1]) and the ESA listed salmon and steelhead therein, including endangered Upper Columbia River spring-run (UCRS) chinook (*Oncorhynchus tshawytscha*) and endangered Upper Columbia River (UCR) steelhead (*O. mykiss*). Additionally, the action area is designated as Essential Fish Habitat (EFH) for chinook (*O. tshawytscha*) and coho (*O. kisutch*) salmon.

The purpose of this document is to present NOAA Fisheries' opinion on whether the proposed action is likely to jeopardize the continued existence of the UCRS chinook and/or UCR steelhead ESUs listed under the ESA. Further, this document will determine if the proposed action will adversely affect designated chinook and coho salmon EFH. These ESA and EFH determinations will be reached by analyzing the biological effects of construction activities related to the Leslie Groves Park and Howard Amon Park projects, relating those effects to the biological and ecological needs of listed species, and then adding these effects to the environmental baseline of the action area.

1.1 Background Information

Leslie Groves Park, at river mile 340 on the west side of the Columbia River, is located in the City of Richland (NW 1/4 Section 36, Township 10N, Range 28E). The park consists of over 149 acres with 8,320 feet of waterfront. Facilities located at the park include picnic shelters, horseshoe pits, a swimming beach, restroom buildings, a children's playground, boat docks, a softball field, tennis courts, a basketball court, soccer fields, a boat ramp, and volleyball courts. The purpose of the project is to increase parking availability and reduce vessel and vehicle congestion during seasonal high-volume periods.

Howard Amon Park, at river mile 337 on the west side of the Columbia River, is located in the City of Richland (NE 1/4 Section 11, Township 9N, Range 28E). The park consists of nearly 46 acres with 2,800 feet of waterfront. Facilities located at the park include a major pathway along the river's edge, gazebos, a wading pool, swings and miscellaneous play equipment, a children's playground, tennis courts, restroom/concession building, a rose garden, an outdoor stage, parking lots, boat docks, boat ramps, a basketball court, and many open picnic areas. The purpose of the project is to increase parking availability and reduce vessel and vehicle congestion during seasonal high-volume periods.

1.2 Consultation History

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[1]"ESU" means a population or group of populations that is considered distinct (and hence a "species") for purposes of conservation under the ESA. To qualify as an ESU, a population must (1) be reproductively isolated from other conspecific populations, and (2) represent an important component in the evolutionary legacy of the biological species (Waples 1991).

On June 10, 2002, NOAA Fisheries received a request from the COE for ESA section 7 formal consultation and Essential Fish Habitat (EFH) consultation to permit the construction and improvement of the Leslie Groves Park and Howard Amon Park boat launch facilities. NOAA Fisheries worked with the COE and City of Richland to gather additional project information, and formal ESA and EFH consultation was initiated on November 21, 2002. This combined ESA and EFH consultation is based on the information presented in the Biological Evaluation (BE) and EFH assessment received June 10, 2002, phone conversations, and electronic mail correspondence.

1.3 Description of the Proposed Action

The COE proposes to issue a permit to the City of Richland for the construction and improvement of boat launch facilities at Leslie Groves Park and Howard Amon Park. The projects at Leslie Groves Park include the expansion of the boat launch, construction of a new dock, and installation of a new gravel parking area. The projects at Howard Amon Park include construction of a new dock and installation of a new paved parking area. In addition, the city is proposing to remove concrete debris and plant riparian vegetation along approximately 200 feet of shoreline within Howard Amon Park.

1.3.1 Leslie Groves Park Project

This portion of the proposed project consists of improvements to the Leslie Groves Park boat launching facilities.

1.3.1.1 Expansion of the boat launch

The proposed boat launch expansion would widen the existing boat launch by 10 feet, from the present width of 60 feet. Widening the boat launch to 70 feet will provide four launching lanes. The boat launch expansion would consist of the following activities:

1. A straw bale and filter fabric silt barrier would be placed between the area of excavation and the Columbia River immediately shoreward of the waterline prior to construction. The silt barrier would be maintained throughout construction activities.

2. An approximately 10 feet by 90 feet area (900 square feet) immediately north of the existing boat launch would be excavated to a depth of 10 inches below the grade of the present launch ramp. Approximately 27 cubic yards of material would be excavated and disposed of off site. All excavation would occur above the ordinary high water line (OHWL). Excavated material would be disposed of in an approved upland facility so that it could not re-enter the water.

3. A 10 feet by 45 feet, by 4 inch thick layer of 1.5 inch crushed rock would be placed in the excavated area. Concrete planks would be installed over the layer of crushed rock.

4. To continue the boat ramp below the OHWL, some leveling would be required to accommodate the installation of the concrete planks. The contractor would install a sediment containment curtain waterward of the construction activity. The curtain would be installed by pushing 10 feet long wood stakes into the substrate at intervals of 6-8 feet along the shoreline. The curtain would be attached to the stakes, with the bottom anchored by rocks placed every 6-

10 feet.

5. Equipment would be operated below the OHWL to establish a level surface for the installation of the concrete planks. Irregularities in the substrate would be smoothed by a track hoe. The area to be leveled below OHWL would be 10 feet by 45 feet. All equipment would be pressure-washed to remove petroleum prior to in-water work, and would be maintained leak-free during construction.

6. Following leveling of the substrate, a 2 inch thick layer of five-eighths to 1.5 inch crushed rock would be placed over the 450 square-foot area. A crane would lower the concrete planks into place over the crushed rock, and SCUBA divers would connect the planks using the attached hook-and-eye bolts.

1.3.1.2 Construction of the new dock

Building the new dock would entail constructing two concrete support blocks (five feet by four feet by six inches thick), one new gangway that consists of two 4 feet by 30 feet sections (total of 240 square feet), and an 8 feet by 80 feet float (640 square feet). The float has a 3 foot-section of grating running down the center. The wood frame, decking, and flotation of the float would be white or light gray in color. Two existing 4 feet by 30 feet sections (total of 240 square feet) of gangway, currently constructed of wood decking, would be replaced with grated decking. The dock construction would consist of the following activities:

1. The existing float and dock would be moved 15 feet to the north. The two H-piles that currently support the dock would be removed.

2. The support blocks would be constructed on the launch ramp to support the aluminum gangways. Construction activities would include building the forms, pouring concrete, and removing the forms following concrete curing.

3. Four new 10 inch piles, sleeved in white 12 inch diameter polyvinyl chloride (PVC) pipe, would be driven with a vibratory pile driver or drop hammer pile driver in parallel rows of two, with the piles in each row located 60 feet apart, and the rows 30 feet apart. The piles would add approximately 40 cubic-feet of in-water structure and cover 4 square feet on the river bottom.

4. The pre-assembled float sections would be transported to the site and launched. The float sections would then be connected together and anchored to the piles.

1.3.1.3 New gravel parking lot

A gravel parking area would be constructed north of Snyder Street in an upland area approximately 100 feet from the Columbia River. Construction of the gravel parking lot would occur independently from, but concurrently with, the other projects. The proposed parking area would provide spaces for 12 vehicle/trailer combinations. Runoff from the proposed parking area would be directed into vegetated drainage swales located directly north of the parking area, approximately 150 feet upland of OHWL. The parking lot construction would consist of the following activities:

1. A straw bale and filter fabric silt barrier would be placed between the area of excavation and the Columbia River prior to construction. The silt barrier would be maintained throughout the duration of the project.

2. The existing vegetation, consisting of cheat grass and tack weed, within a 160 feet by 50 feet area (8,000 square feet) would be cleared with a bulldozer, and the cleared area would be covered with a six inch layer of 1.5 inch crushed rock.

1.3.2 Howard Amon Park Project

This portion of the proposed project consists of improvements to the North Howard Amon Park boat launching facilities.

1.3.2.1 New dock construction

The proposed new float would be 8 feet by 80 feet and placed perpendicular to the shoreline with a dogleg section 8 feet by 60 feet (total area of 1,120 square feet). The float would include a three foot-section of grating down the center. The wood frame, decking, and flotation of the float would be white or light gray in color. The gangway consists of two 4 foot by 40 foot sections (total 320 square feet). In addition, two existing 4 foot by 33 foot-sections of gangway with wood plank decking would be replaced with grating. The dock construction would consist of the following activities:

1. Construction of the support block to support the aluminum gangway. Construction activities would include building the forms, pouring concrete, and removing the forms following concrete curing.

2. Four new 10 inch piles, sleeved in white 12 inch diameter PVC pipe, would be driven with a vibratory pile driver or drop hammer pile driver. The piles would add approximately 77 cubic feet of in-water structure and cover 4 square feet on the river bottom.

3. The pre-assembled float sections would be transported to the site and launched. The float sections would then be connected together and anchored to the piles.

1.3.2.2 New parking area

The paved parking area north of the boat launch facilities would be expanded to accommodate 25 additional trailer spaces. The remaining one-half acre area north of the proposed parking area would be landscaped. The parking lot construction would consist of the following activities:

1. A straw bale and filter fabric silt barrier would be placed between the area of excavation and the Columbia River prior to construction. The silt barrier would be maintained throughout the

duration of the project.

2. Construction would consist of clearing the existing vegetation and debris and covering the proposed parking area with crushed rock followed by asphalt.

3. An irrigation system would be installed and the area would be landscaped and vegetated.

1.3.3 Minimization and Conservation Components

The City of Richland has committed to restoring a 15 foot by 200 foot-section (3,000 square feet) of shoreline just north of the North Howard Amon Park boat launch site. The work would consist of the removal of large pieces of refuse concrete along the shoreline. The site would then be planted with two hundred willows and two black cottonwoods.

In addition to the above project components the City of Richland is also committed to these conservation measures.

- No uncured concrete will be allowed to enter the Columbia River.
- The construction will occur after August 1 and before February 28.
- All construction debris shall be properly disposed of in such a manner that it cannot enter into the waterway or cause water quality degradation.
- The entire surface area of the gangways/walkways will be grated.
- All grating will be rated at greater than 60% open area.

1.4 Description of the Action Area

Under the ESA, the "action area" is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 C.F.R. 402.02). For the purposes of this consultation the action area includes Lake Wallula/McNary Dam reservoir from McNary Dam at river mile 292 to Priest Rapids Dam at river mile 397.1 of the Columbia River. Although most effects of the action will be localized, increases in predator population and boating activity have the potential to affect listed salmonids throughout the reservoir.

2.0 ENDANGERED SPECIES ACT

2.1 Biological Opinion

The objective of this BiologicalOpinion (Opinion) is to determine whether the proposed project is likely to jeopardize the continued existence of the UCRS chinook and UCR steelhead ESUs.

2.1.1 Status of Species

The listing status and biological information for NOAA Fisheries listed species that are the subject of this consultation are described below in Table 1.

Species	Listing Status	Critical Habitat	Protective Regulations	Biological Information
Upper Columbia River spring-run chinook salmon	March 24, 1999; 64 Fed. Reg. 14308, Endangered	Not Designated[2]	July 10, 2000; 65 Fed. Reg. 42422	Myers *et al* 1998; Healey 1991
Upper Columbia River steelhead	August 18, 1997; 62 Fed. Reg. 43937, Endangered	Not Designated	July 10, 2000; 65 Fed. Reg. 42422	Busby *et al* 1995; 1996

Table 1. References for Additional Background on Listing Status, Biological Information, and Critical Habitat Elements for the Listed and Proposed Species Addressed in this Opinion.

Throughout the Columbia Basin, salmonids have been negatively affected by a combination of habitat alteration and hatchery management practices. Mainstem dams on the Columbia River, are perhaps the most significant source of habitat degradation in the ESUs addressed under this consultation. The dams act as a partial barrier to passage, kill out-migrating smolts in their turbines, raise temperatures throughout the river system, and have created lentic refugia for salmonid predators. In addition to dams, irrigation systems have had a major negative impact by diverting large quantities of water, stranding fish, acting as barriers to passage, and returning effluents containing chemicals and fine sediments. Other major habitat degradation has occurred through urbanization and livestock grazing practices (WDFW *et al* 1993; Busby *et al* 1996; NMFS 1996a; 1998; 2000; 64 Fed. Reg. 14308, March 24, 1999; 62 Fed. Reg. 43937, August 18, 1997).

Habitat alterations and differential habitat availability (*e.g.*, fluctuating discharge levels) impose an upper limit on the production of naturally spawning populations of salmon and steelhead. The National Research Council Committee on Protection and Management of Pacific Northwest Anadromous Salmonids identified habitat problems as a primary cause of declines in wild salmon runs (NRCC 1996). Some of the habitat impacts identified were the fragmentation and loss of available spawning and rearing habitat, migration delays, degradation of water quality, removal of riparian vegetation, decline of habitat complexity, alteration of streamflows and streambank and channel morphology, alteration of ambient stream water temperatures, sedimentation, and loss of spawning gravel, pool habitat and large woody debris (NMFS 1996a; 1998; NRCC 1996; Bishop and Morgan 1996).

[2]Under development. On April 30, 2002, the U.S. District Court for the District of Columbia approved a NOAA Fisheries consent decree withdrawing a February 2000 Critical Habitat designation for this and 18 other ESUs.

Hatchery management practices are suspected to be a major factor in the decline of these ESUs. The genetic contribution of non-indigenous, hatchery stocks may have reduced the fitness of the locally adapted native fish through hybridization and associated reductions in genetic variation or introduction of deleterious (non-adapted) genes. Hatchery fish can also directly displace natural spawning populations, compete for food resources, or engage in agonistic interactions (Campton and Johnston 1985; Waples 1991b; Hilborn 1992; NMFS 1996a; 63 Fed. Reg. 11798, March 10, 1998).

The following information summarizes the status of Columbia River salmonids by ESU that are the subjects of this consultation. Most of the following information was previously presented in the Opinion on Reinitiation of Consultation on Operation of the Federal Columbia River Power System(FCRPS) , Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin (NMFS 2000).

2.1.1.1 Upper Columbia River Spring Chinook

The UCRS chinook salmon ESU, listed as endangered on March 24, 1999 (64 Fed. Reg. 14308), includes all natural-origin, stream-type chinook salmon from river reaches above Rock Island Dam and downstream of Chief Joseph Dam, including the Wenatchee, Entiat, and Methow River basins. All chinook in the Okanogan River are apparently ocean-type and are considered part of the UCR summer- and fall-run ESU. The spring-run components of the following hatchery stocks are also listed: Chiwawa, Methow, Twisp, Chewuch, and White rivers and Nason Creek. Critical Habitat is not currently designated for UCRS chinook, although a re-designation is likely forthcoming (see footnote 2).

The populations are genetically and ecologically separate from the summer- and fall-run populations in the lower parts of many of the same river systems (Myers *et al* 1998). Although fish in this ESU are genetically similar to spring chinook in adjacent ESUs (*i.e.*, mid-Columbia and Snake), they are distinguished by ecological differences in spawning and rearing habitat preferences. For example, spring-run chinook in upper Columbia tributaries spawn at lower elevations (500 to 1,000 meters) than in the Snake and John Day River systems.

The upper Columbia River populations were intermixed during the Grand Coulee Fish Maintenance Project (1939 through 1943), resulting in a loss of genetic diversity between populations in the ESU. Homogenization remains an important feature of the ESU. Fish abundance has trended downward both recently and over the long term. At least six former populations from this ESU are now extinct, and nearly all extant populations have experienced escapements of fewer than 100 wild spawners in recent years. UCRS chinook occur within the action area only during their smolt and adult migrations.

2.1.1.2 Upper Columbia River Steelhead

The UCR steelhead ESU, listed as endangered on August 18, 1997 (62 Fed. Reg. 43937), includes all natural-origin populations of steelhead in the Columbia River basin upstream from the Yakima River, Washington, to the U.S./Canada border. The Wells Hatchery stock is included among the listed populations. Critical Habitat is not presently designated for UCR steelhead, although re-designation is likely forthcoming (see footnote 2).

This ESU occupies the Columbia River basin upstream of the Yakima River. Rivers in the area primarily drain the east slope of the northern Cascade Mountains and include the Wenatchee, Entiat, Methow, and Okanogan River basins. The climate of the area reaches temperature and precipitation extremes; most precipitation falls as mountain snow. The river valleys are deeply dissected and maintain low gradients, except for the extreme headwaters (Franklin and Dyrness 1973).

Estimates of historical (pre-1960s) abundance specific to this ESU are available from fish counts at dams. Counts at Rock Island Dam from 1933 to 1959 averaged 2,600 to 3,700, suggesting a prefishery run size exceeding 5,000 adults for tributaries above Rock Island Dam (Chapman *et al* 1994). Runs may, however, already have been depressed by lower Columbia River fisheries. UCR steelhead occur within the action area only during their smolt and adult migrations.

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 C.F.R. part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of (1) defining the biological requirements of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

From that, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries considers the extent and manner of habitat changes attributed to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed species’ life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

2.1.2.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying ESA section 7(a)(2) to listed salmon is to define the species’ biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species; taking into account population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its original decision to list the species for protection under the ESA. In addition, the assessment will consider any new information or data that are relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which time protection under the ESA would be unnecessary. Species or ESUs not requiring ESA protection have the following attributes: population sizes large enough to maintain genetic diversity and heterogeneity, the ability to adapt to and survive environmental variation, and are self-sustaining in the natural environment.

UCRS chinook and UCR steelhead share similar basic biological requirements. These requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence *et al* 1996). The specific biological requirements affected by the proposed action include water quality, food, and unimpeded migratory access.

NOAA Fisheries has related the biological requirements for listed salmonids to a number of habitat attributes, or pathways, in the Matrix of Pathways and Indicators (MPI). These pathways (Water Quality, Habitat Access, Habitat Elements, Channel Condition and Dynamics, Flow/Hydrology, Watershed Conditions, Disturbance History, and Riparian Reserves) indirectly measure the baseline biological health of listed salmon populations through the health of their habitat. Specifically, each pathway is made up of a series of individual indicators (*e.g.,* indicators for Water Quality include Temperature, Sediment, and Chemical Contamination) that are measured or described directly (see NMFS 1996b). Based on measurement or description, each indicator is classified within a category of the properly functioning condition (PFC) framework: (1) properly functioning, (2) at risk, or (3) not properly functioning. The Habitat Approach defines properly functioning condition as “the sustained presence of natural habitat forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation.”

2.1.2.2 Environmental Baseline

The environmental baseline represents the current basal set of conditions to which the effects of the proposed action would be added. The term “environmental baseline” means “the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process” (50 C.F.R. 402.02).

The most recent evaluation of the environmental baseline for the Columbia River is part of the NOAA Fisheries’s Opinion for the FCRPS issued in December 2000. This Opinion assessed the entire Columbia River system below Chief Joseph Dam, and downstream to the farthest point (the Columbia River estuary and nearshore ocean environment) at which ESA-listed salmonids are influenced. A detailed evaluation of the environmental baseline of the Columbia River basin can be found in the FCRPS Opinion (NMFS 2000).

The quality and quantity of freshwater habitat in much of the Columbia River basin has declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and urbanization have radically changed the historical habitat conditions of the basin. Depending on the species, they spend from a few days to one or two years in the

Columbia River and its estuary before migrating out to the ocean, and another one to four years in the ocean before returning as adults to spawn in their natal streams.

Water quality in streams throughout the Columbia River basin has been degraded by dams and diversion structures, water withdrawals, farming and grazing, road construction, timber harvest activities, mining activities, and urbanization. Tributary water quality problems contribute to poor water quality where sediment and contaminants from these tributaries settle in mainstem reaches and the estuary. Temperature alterations also affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land use practices that create shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also a significant cause of habitat degradation and reduced fish production. Withdrawing water for irrigation, urban, and other uses can increase temperatures, smolt travel time, and sedimentation. Return water from irrigated fields can introduce nutrients and pesticides into streams and rivers. On a larger landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been developed. Urbanization paves over or compacts soil and increases the amount and pattern of runoff reaching rivers and streams.

Based on the best available information regarding the current status of the listed species range wide, the population status, trends, genetics, and the poor environmental baseline conditions within the action areas, NOAA Fisheries concludes that the biological requirements of these species are not currently being met. Degraded habitat resulting from agricultural practices, forestry practices, road building, and residential construction, indicate that many aquatic habitat indicators are not properly functioning within the Columbia River Basin. Applying the principles of the "Habitat Approach" it is clear that actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of these species.

2.1.2.2.1 Factors Affecting the Species at the Population Scale

In other Opinions, NOAA Fisheries assessed life history, habitat and hydrology, hatchery influence, and population trends in analyzing the effects of the underlying action on affected species at the population scale (see, for example, FCRPS, NMFS 2000). A thumbnail description of each of these factors for each ESU covered under this consultation is provided below.

Upper Columbia River Spring Chinook

Life History. UCRS chinook are considered stream-type fish, with smolts migrating as yearlings. Most stream-type fish mature at four years of age. Few coded-wire tags are recovered in ocean fisheries, suggesting that the fish move quickly out of the north central Pacific and do not migrate along the coast.

Habitat and Hydrology. Salmon in this ESU must pass up to nine Federal and private dams, and Chief Joseph Dam prevents access to historical spawning grounds farther upstream. Degradation of remaining spawning and rearing habitat continues to be a major concern associated with urbanization, irrigation projects, and livestock grazing along riparian corridors. Overall harvest rates are low for this ESU, currently less than 10% (ODFW and WDFW 1995).

Hatchery Influence. Spring-run chinook salmon from the Carson National Fish Hatchery (a large composite, nonnative stock) were introduced into and have been released from local hatcheries (Leavenworth, Entiat, and Winthrop National Fish Hatcheries [NFH]). Little evidence suggests that these hatchery fish stray into wild areas or hybridize with naturally spawning populations. In addition to these national production hatcheries, two supplementation hatcheries are operated by the WDFW in this ESU. The Methow Fish Hatchery Complex (operations began in 1992) and the Rock Island Fish Hatchery Complex (operations began in 1989) were both designed to implement supplementation programs for naturally spawning populations on the Methow and Wenatchee rivers, respectively (Chapman *et al* 1995).

Population Trends and Risks. For the UCRS chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[3] ranges from 0.85 to 0.83, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al* 2000b). NOAA Fisheries has also estimated median population growth rates and the risk of absolute extinction for the three spawning populations identified by Ford *et al* (1999), using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (*i.e.*, hatchery effectiveness = 0), the risk of absolute extinction within 100 years ranges from 0.97 for the Methow River to 1.00 for the Methow and Entiat rivers (Table B-5 in McClure *et al* 2000b). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of extinction within 100 years is 1.00 for all three spawning populations (Table B-6 in McClure *et al* 2000b).

[3]Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period that varies between spawning aggregations. Population trends are projected under the assumption that all conditions will stay the same into the future.

NOAA Fisheries has also used population risk assessments for UCRS chinook salmon and steelhead ESUs from the draft quantitative analysis report (QAR) (Cooney 2000). Risk assessments described in that report were based on Monte Carlo simulations with simple spawner/spawner models that incorporate estimated smolt carrying capacity. Population dynamics were simulated for three separate spawning populations in the UCRS chinook salmon ESU, the Wenatchee, Entiat, and Methow populations. The QAR assessments showed extinction risks for UCRS chinook salmon of 50% for the Methow, 98% for the Wenatchee, and 99% for the Entiat spawning populations. These estimates are based on the assumption that the median return rate for the 1980 brood year to the 1994 brood year series will continue into the future.

Upper Columbia River Steelhead

Life History. As in other inland ESUs (the Snake and mid-Columbia River basins), steelhead in the Upper Columbia River ESU remain in freshwater up to a year before spawning. Smolt age is dominated by two-year-olds. Based on limited data, steelhead from the Wenatchee and Entiat rivers return to freshwater after one year in salt water, whereas Methow River steelhead are primarily age-two-ocean (Howell *et al* 1985). Life history characteristics for UCR steelhead are similar to those of other inland steelhead ESUs; however, some of the oldest smolt ages for steelhead, up to seven years, are reported from this ESU. The relationship between anadromous and nonanadromous forms in the geographic area is unclear.

Habitat and Hydrology. The Chief Joseph and Grand Coulee dam construction caused blockages of substantial habitat, as did that of smaller dams on tributary rivers. Habitat issues for this ESU relate mostly to irrigation diversions and hydroelectric dams, as well as to degraded riparian and instream habitat from urbanization and livestock grazing.

Hatchery Influence. Hatchery fish are widespread and escape to spawn naturally throughout the region. Spawning escapement is dominated by hatchery-produced fish.

Population Trends and Risks. For the UCR steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period ranges from 0.94 to 0.66, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al* 2000b). NOAA Fisheries has also estimated the risk of absolute extinction for the aggregate UCR steelhead population, using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (*i.e.*, hatchery effectiveness = 0), the risk of absolute extinction within 100 years is 0.25 (Table B-5 in McClure *et al* 2000b). Assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years is 1.00 (Table B-6 in McClure *et al* 2000b). Because of data limitations, the QAR steelhead assessments in Cooney (2000) were limited to two aggregate spawning groups-the Wenatchee/Entiat composite and the above-Wells populations. Wild production of steelhead above Wells Dam was assumed to be limited to the Methow system. Assuming a relative effectiveness of hatchery spawners of 1.0, the risk of absolute extinction within 100 years for UCR steelhead is 100%. The QAR also assumed hatchery effectiveness values of 0.25 and 0.75.

A hatchery effectiveness of 0.25 resulted in projected risks of extinction of 35% for the Wenatchee/Entiat and 28% for the Methow populations. At a hatchery effectiveness of 0.75, risks of 100% were projected for both populations.

2.1.2.2.2 Factors Affecting the Species within the Action Area

Section 4(a)(1) of the ESA and NOAA Fisheries listing regulations (50 C.F.R. 424) set forth procedures for listing species. The Secretary of Commerce must determine, through the regulatory process, if a species is endangered or threatened based upon any one or a combination of the following factors; (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

The proposed action includes activities that will have some level of effects with short-term impacts from category (1), above. Indirectly, listed salmonids are likely to experience effects described in category (3). Outside of the proposed action, categories (4) and (5) are factors likely to affect salmonids in the action area over the long term. The dominant factors affecting UCRS chinook and UCR steelhead within the action area include hydroelectric facility operations and maintenance, and land use and shoreline development.

Hydroelectric Facilities. Hydropower development in the Columbia River has profoundly altered the riverscape of the action area, which is located within the McNary Dam pool (Lake Wallula), downstream of Priest Rapids Dam. These dams and other similar structures have caused a broad range of habitat degradation, and altered the structure and function of the Columbia River by converting a riverine environment to a series of reservoirs. Consequently, a host of indicators within numerous pathways of the MPI have been affected. Specifically, hydroelectric facility operations and maintenance have altered natural flow regimes, produced broad diel flow fluctuations, altered temperature profiles, inundated spawning habitat, created passage barriers, diminished sediment transport, eliminated lotic channel characteristics, altered riparian habitat, and expanded suitable habitat for piscivorous species (both native and exotic) that prey on or compete with salmonids.

Land Use and Shoreline Development. In the action area of this project, numerous anthropogenic features and/or activities (*e.g.,* dams, marinas, docks, residential dwellings, roads, railroads, rip-rap, and landscaping) have become permanent fixtures on the landscape and have displaced and altered native riparian habitat to some degree. Consequently, the potential for normal riparian processes (*e.g*., shading, bank stabilization, and Large woody debris recruitment) to occur is diminished, and aquatic habitat has become simplified (Ralph *et al* 1994; Young *et al* 1994; Fausch *et al* 1994; Dykaar and Wigington 2000).

Shoreline development has reduced the quality of nearshore salmonid habitat by eliminating native riparian vegetation, displacing shallow water habitat with fill materials, and by further disconnecting the Columbia River from historic floodplain areas. Further, riparian species that evolved under the environmental gradients of riverine ecosystems are not well suited to the present hydraulic setting of the action area (*i.e.*, static, slackwater pools), and are thus often replaced by nonnative, exotic species (Rood and Mahoney 1990; Scott *et al* 1996; Rood and Mahoney 2000; Braatne and Jamieson 2001).

2.1.3 Effects of the Proposed Action

The proposed permitting of the construction and improvement of the boat launch facilities at Leslie Groves Park and Howard Amon Park is likely to adversely affect UCRS chinook and UCR steelhead. The portion of the Columbia River that flows through the action is a migration corridor for both adults and smolts, it also provides juvenile rearing habitat for both of these species.

NOAA Fisheries' ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline" (50 C.F.R. 402.02).

2.1.3.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated and interdependent actions. Future Federal actions that are not a direct effect of the action under consideration (and not included in the environmental baseline or treated as indirect effects) are not evaluated (USFWS and NMFS 1998).

<u>2.1.3.1.1 Turbidity</u>

The proposed action would permit construction activities in and near the water. These activities can mobilize sediments, temporarily increasing local turbidity levels in the Columbia River. In the immediate vicinity of the construction activities (several meters), the level of turbidity would likely exceed the natural background levels and affect fish. The proposed action includes measures to decrease the likelihood and extent of any such effects on listed salmonids. These measures include timing restrictions and construction Best Management Practices(BMPs).

Quantifying turbidity levels, and their effect on fish species, is complicated by several factors. First, turbidity from an activity will typically decrease as distance from the activity increases. How quickly turbidity levels attenuate is dependent upon the quantity of materials in suspension (*e.g.*, mass or volume), the particle size of suspended sediments, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments. Second, the impact of turbidity on fish is not only related to the turbidity levels, but also the particle size of the suspended sediments.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (*i.e.*, gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982; Sigler *et al* 1984; Berg and Northcote 1985; Servizi and

Martens 1992). The magnitude of these stress responses is generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35-150 NTU) accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect).

Turbidity from the project will likely be short-lived with a low potential for causing take. Furthermore, the project includes measures to reduce or avoid the effects of turbidity on the listed salmonids. These measures include a best management practice (BMP) and restricting the timing of work to avoid affecting incubating eggs. The BMP consists of the use of a silt curtain to limit water exchange between the project area and the Columbia River. Limiting water exchange will minimize, if not avoid increasing turbidity beyond the immediate project site.

2.1.3.1.2 Percussive Damage (Pile Driving)

The proposed action would permit construction activities that include pile driving in and near the water. When driving steel piles, impact hammers produce intense, sharp spikes of sound which can reach levels that harm or even kill fishes (*e.g.*, FRPD Ltd. 2001; Washington State Ferries 2001; NMFS 2002; J. Stadler, NOAA Fisheries, pers. comm. 2002). The extent to which the noise would disturb fish would be related to the distance between the sound source and affected fish and by the duration and intensity of pile driving. The type and intensity of the sounds produced during pile driving depend on a variety of factors, including, but not limited to, pile type and size, the firmness of the substrate into which the pile is being driven, water depth, and the type and size of the pile-driving hammer. The proposed action includes measures to decrease the likelihood and extent of any such affect on listed salmonids. These measure include timing restrictions and construction BMPs.

Fishes may respond to the first few strikes of an impact hammer with a "startle" response. After these initial strikes, the startle response wanes and the fishes may remain within the field of a potentially-harmful sound (Sonalysts Inc. 1997; NMFS 2002). To elicit an avoidance response, a sound must be in the infrasound range (<20 Hz) and the fish must be exposed to the sound for several seconds (Enger *et al* 1993; Knudsen *et al* 1994; Sand *et al* 2000). Such sounds are similar to those produced when piles are driven with a vibratory hammer. Impact hammers, however, produce such short spikes of sound with little energy in the infrasound range that avoidance is not elicited (Carlson *et al* 2001). Thus, impact hammers may be harmful for two reasons. First, they produce more intense pressure waves. Second, the sounds produced do not elicit an avoidance response in fishes, leading to persist in the area in which they remain exposed to those harmful pressures.

The effects of pile driving sound on fishes depends on several factors, including the sound pressure levels (SPL) being transmitted and the size and species of fish. There is little data on the SPL required to cause harm to fishes. Carlson *et al* (2001) reported that impact driving of 12 inch diameter wood piles produced peak SPLs up to 195 decibels (dB) (re: 1µPa). Short-term exposure to SPLs above 180 dB (re:1 µPa) are thought to inflict physical harm on fishes

(Hastings 1995, cited in NMFS 2002). Based on the known range of hearing for salmon, Feist *et al* (1992) suggested that the sounds of impact driving of concrete piles were audible to salmon up to 600 meters from the pile-driver, and that salmonids in close proximity (<10 meters) to pile driving may experience temporary or permanent hearing loss.

Throughout the study of pile driving effects on juvenile salmonids, Feist (1991) found that pile installation operations affected the distribution and behavior of fish around the site. For example, the abundance of fish during non-pile driving days was two fold greater than on days when pile driving occurred. Additionally, salmonids were less responsive to the activity of observers on the shore during pile driving than during periods without pile driving. This reduced responsiveness may put them at greater risk of predation.

On several occasions, fish mortality and/or fish distress has been observed during installation of steel piles using impact hammers. At the Mukilteo ferry dock, during impact hammer installation of 24 inch and 30-inch diameter steel pilings, juvenile striped surfperch (*Embiotoca lateralis*) floated to the surface and were immediately eaten by birds (Washington State Ferries 2001). The Department of Ocean and Fisheries Canada related that mortality of juvenile salmon, perch, and herring occurred during impact driving of 36-inch steel piles at the Canada Place Cruise Ship Terminal in Vancouver, British Columbia. More recently, a number of shiner perch (*Cymatogaster aggregata*) and striped surfperch were killed during impact driving of 30-inch diameter steel pilings at the Winslow Ferry Terminal in Washington, (J. Stadler, NOAA Fisheries, pers. comm. 2002). Most of the dead fishes were the smaller *C. aggregata* and similar sized specimens of *E. lateralis*, even though many larger *E. lateralis* were in the same area. Dissections revealed that the swimbladder of the smallest of the fishes (80 mm FL) were completely destroyed, while those of the largest individual (170 mm FL) was nearly intact, indicating a size-dependent effect. The sound pressure levels that killed these fishes are not yet known. Of the reported fish-kills associated with pile driving, all have occurred during use of an impact hammer (*e.g.*, FRPD Ltd. 2001; Washington State Ferries 2001; NMFS 2002; J. Stadler, NOAA Fisheries, pers. comm. 2002).

Research and field observations show that effects associated with pile driving can range from disruption of schooling behavior to fish death. Deleterious effects to listed salmonids in the action area would be minimized if the project proponent uses, to the fullest extent possible, vibratory pile-driving equipment. However, NOAA Fisheries realizes that this type of equipment has limited utility in project areas underlain by dense, hard, or compacted strata. Therefore, if impact hammer pile-driving equipment is used, in-water operations will only occur between December 15th and February 28th in the year(s) during which the project receives permit(s). Restricting in-water operations to this time period minimizes the potential for adverse effects to listed chinook and steelhead because adults and juveniles are least likely to be present in the action area during this work-window.

2.1.3.1.3 Lost Benthic Habitat

The footprint of the proposed action will result in the net loss of 458 square feet of benthic habitat in the Columbia River. Benthic habitats provide forage, cover, and breeding opportunities for riverine fishes (Allan 1995; Waters 1995; Stanford *et al* 1996). However, it is unlikely that listed salmonids derive much benefit from the benthos that will be removed by the addition of eight driven steel pilings because of the depth at which it is found (*i.e.,* 15-foot, on average) or the 450 square feet that is adjacent to the current boat launch ramp. Therefore, the impacts of lost benthic habitat to listed salmonids in the action area are likely to be very minor.

2.1.3.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or be a logical extension of the proposed action.

2.1.3.2.1 Predation

The Leslie groves Park project is adding four new pilings that will add approximately 40 cubic feet of structure in the water and 640 square feet of structure over the water. The Howard Amon Park project is adding four new pilings that will add approximately 77 cubic feet of structure in the water and 1,120 square feet of structure over the water. Addition of pilings and decking can create beneficial structure for fish species that prey on young salmonids. Therefore, predation on listed salmonids could increase as a result of the Leslie Groves Park and Howard Amon Park projects. As a result, the project includes measures (including grating, reflective dock components) to decrease the likelihood and extent of any such affects on listed salmonids.

Native (*e.g.*, northern pikeminnow) and exotic (*e.g.*, smallmouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), white crappie (*P. annularis*), and yellow perch (*Perca flavescens*)) piscine predators are year-round residents of the McNary Dam reservoir and are also known to consume listed salmon and steelhead (Bennett *et al* 1983). While NOAA Fisheries is not aware of any studies which have been done to specifically determine impacts of in-water and overwater structures in the Columbia River system on listed salmonids, numerous analogous predation studies suggest that serious predation impacts from these emplacements are likely to occur. Increased predation impacts are a function of increased predation rates on listed salmonids, as well as increased predator populations from introduced artificial habitat that imparts rearing and ambush habitat for native and exotic predator species.

Four major predatory strategies are utilized by piscivorous fish: prey pursuit; prey ambush; prey habituation to a non-aggressive illusion; or prey stalking (Hobson 1979). Ambush predation is probably the most commonly employed predation strategy. Predators lie-in-wait, then dart out at prey in an explosive rush (Gerking 1994). Oftentimes, predators use sheltered areas that provide velocity shadows to ambush prey fish in faster currents (Bell 1991). The addition of eight pilings to the action area will provide a total of approximately 117 square feet of vertical current blockage that will impart velocity shadows of unknown size that expand and contract as discharge changes. These velocity shadow areas will likely be used by resting salmonids as well as ambush predators waiting to capture them.

Additionally, light plays an important role in both predation success and prey defense mechanisms. Prey species are better able to see predators under high light intensity, thus providing the prey species with a relative advantage (Hobson 1979). Petersen and Gadomski (1994) found that predator success was higher at lower light intensities. Prey fish lose their ability to school at low light intensities, making them vulnerable to predation (Petersen and Gadomski 1994). Howick and O'Brien (1983) found that under high light intensities, prey species (bluegill (*Lepomis macrochirus*)) can locate largemouth bass (*Micropterus dolomieu*) before they are seen by the bass. However, under low light intensities, bass can locate the prey before they are seen. Walters *et al* (1991) indicate that high light intensities may result in increased use of shade-producing structures by predators, while Bell (1991) states that "light and shadow paths are utilized by predators advantageously."

In-water and overwater structures create light/dark interface conditions (*i.e.,* shadows) that allow ambush predators to remain in darkened areas (barely visible to prey) and watch for prey to swim by against a bright background (high visibility). Prey species moving around structure(s) are unable to see predators in dark areas under or beside structure(s) and are more susceptible to predation. Juvenile salmonids, especially ocean type chinook (among others), may utilize backwater areas during their out-migration (Parente and Smith 1981). The presence of predators may force smaller prey fish species into less desirable habitats, disrupting foraging behavior, and depressing growth (Dunsmoor *et al* 1991). Bevelhimer (1996), in studies on smallmouth bass, indicates that ambush cover and low light intensities create a predation advantage for predators and can also increase foraging efficiency. Ward (1992) found that stomachs of pikeminnow in developed areas of Portland Harbor contained 30% more salmonids than those in undeveloped areas, although undeveloped areas contained more pikeminnows.

Literature and anecdotal evidence substantiates the use of docks and other structures by juvenile predators for rearing purposes. Juvenile predators may derive a survival advantage from use of these structures by avoiding predation by their larger conspecifics (Hoff 1991; Carrasquero 2001). Additionally, smallmouth bass have been observed to preferentially locate nest sites near artificial structures (Pflug and Pauley 1984; Hoff 1991). Hoff (1991) documents increases of successful smallmouth bass nests of 183% to 443% and increases in catch/effort for fingerlings of 607% to 3,840% in Wisconsin lakes after the installation of half-log structures, concluding that increasing nesting cover in lakes with low nest densities, poor quality and/or quantity of nesting cover, and low first-year recruitment rates can significantly increase recruitment. The proposed action is likely to increase rearing and spawning habitat for predators, which may improve spawning success and lead to an overall population increase.

Native predators such as northern pikeminnow, and introduced predators such as smallmouth bass, black crappie, white crappie, and potentially, yellow perch (Ward *et al* 1994; Poe *et al* 1991; Beamesderfer and Rieman 1991; Rieman and Beamesderfer 1991; Petersen *et al* 1990; Pflug and Pauley 1984; and Collis *et al* 1995) likely utilize habitat created by in-water and overwater structures (Ward and Nigro 1992; Pflug and Pauley 1984) such as the eight pilings proposed under the action under consultation. The proposed action will add both ambush and shadow areas for piscine predators. UCRS chinook and UCR steelhead use the action area for migratory purposes, and some individuals may actually rear throughout the area. The extent of increase in predation on salmonids in the Columbia River resulting from overwater structures is not well known. Further, salmon stocks with already low abundance are susceptible to further depression by predation (Larkin 1979).

In addition to piscivorus predation, in-water structures (tops of pilings) also provide perching platforms for avian predators such as double-crested cormorants (*Phalacrocorax auritis*) (Kahler *et al* 2000), from which they can launch feeding forays or dry plumage. Placement of pilings to support the dock structures will potentially provide some usage by cormorants. However, placement of anti-perching devices on the top of pilings should preclude their use by any potential avian predators.

Based on the presence of salmonids and native and exotic predators in the action area, and the additional shading and vertical structure created by the installation of two new docks and eight new pilings, it appears likely that the proposed action will contribute to increased predation rates on listed juvenile salmonids. Further, these pilings will create spawning and rearing habitats that could increase predator populations by adding approximately 117 cubic feet of in-water structure and 1,760 square feet of overwater structure. Relatively speaking, the extent to which the Leslie Grove Park and Howard Amon Park projects will benefit predaceous fish cannot be estimated. However, when added to the environmental baseline, advantageous predator habitat created by this proposed action will likely result in only a minor increase in predation rates on listed salmonids.

2.1.3.2.2 Littoral Productivity

The docks at Leslie Groves Park and Howard Amon Park add approximately 1,760 square feet of over-water structure. Docks may have some general effects on littoral productivity. The shade that docks create may inhibit the growth of aquatic macrophytes and other plant life (*e.g.*, epibenthic algae and pelagic phytoplankton). However, the project includes measures (*i.e.*, grating, reflective dock components) to decrease the likelihood and extent of any such effects on listed salmonids.

Aquatic plant life is the foundation for most aquatic food webs and their presence or absence affects many higher trophic levels (*e.g.*, invertebrates and fishes). Autochthonous pathways are of overriding importance in the trophic support of juvenile salmonids (Murphy 1991). In large rivers, autotrophs are more abundant nearer the shore (Naiman *et al* 1980). Consequently, the shade from docks may affect local plant/animal community structure or species diversity. At a minimum, shade from docks may affect the overall productivity of littoral environments (Kahler *et al* 2000).

The proposed action includes measures to reduce the likelihood and extent of effects from this activity by incorporating conservative dock design criteria. Partially surfacing each float deck with grating and using reflective materials for in-water components is expected to result in more natural light conditions beneath the proposed structures than would result from using traditional materials. In addition, the City of Richland is proposing to plant a 3,000 square foot section of riparian vegetation to partially compensate for lost productivity. Furthermore, given the small footprint of the docks relative to the total surface area of littoral habitat in the action area, it is unlikely that primary productivity will be significantly impacted.

2.1.3.2.3 Boating Activity

Adding new docks may increase levels of boating activity in the reservoirs, especially near the docks. Although the type and extent of boating activity that might be enhanced by the proposed action are outside of the discretionary action under consultation herein, boating activity might cause several impacts on listed salmonids and aquatic habitat. Engine noise, prop movement, and the physical presence of boat hulls may disturb or displace nearby fishes (Mueller 1980; Warrington 1999a).

Boat traffic may also cause (1) increased turbidity in shallow waters, (2) uprooting of aquatic macrophytes in shallow waters, (3) aquatic pollution (through exhaust, fuel spills, or release of petroleum lubricants), and (4) shoreline erosion (Warrington 1999b). These boating impacts indirectly affect listed fish in a number of ways. Turbidity may injure or stress affected fishes, as discussed in more detail in section 2.1.3.1.1. The loss of aquatic macrophytes may expose salmonids to predation, decrease littoral productivity, or alter local species assemblages and trophic interactions. Despite a general lack of data specifically for salmonids, pollution from boats may cause short-term injury, physiological stress, decreased reproductive success, cancer, or death for fishes in general. Further, pollution may also impact fishes by impacts to potential prey species or aquatic vegetation.

The new docks and boat launch expansion are likely to cause a small increase in boat launching capacity in The City of Richland. However this should only lead to a slight increase in boat use and therefore a negligible effect on listed salmonids.

2.1.3.3 Population Scale Effects

As detailed in Section 2.1.2.2, NOAA Fisheries has estimated the median population growth rate (lambda) for each species potentially affected by the Leslie Groves Park and Howard Amon Park boat launch expansion and improvement projects. Under the environmental baseline, life history diversity has been limited by the influence of hatchery fish, by physical barriers that prevent migration to historical spawning and/or rearing areas, and by water temperature barriers that influence the timing of emergence, juvenile growth rates, or the timing of upstream or downstream migration. Additionally, hydropower development has profoundly altered the riverine environment and those habitats vital to the survival and recovery of the ESUs that are the subject of this consultation.

The boat launch expansion and improvement project is expected to add temporary, construction-related effects to the existing environmental baseline. Further, NOAA Fisheries believes that long-term, minor increases in predation rates and predator populations will occur as well. However, these effects are addressed in kind by a variety of minimization measures, dcreasing their significance at the within the action area and, in turn, on the population level. Therefore, NOAA Fisheries believes that the proposed action does not contain measures that are likely to influence population trends, habitat and hydrology, life-history diversity, or the influence of hatcheries on the ESU compared to conditions under the environmental baseline.

2.1.4 Cumulative Effects

Cumulative effects are defined as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 C.F.R. 402.02). Future Federal actions that are unrelated to the proposed actions are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Riparian zones in the action area are not properly functioning, which is largely attributable to urban and agricultural encroachment. Although land use practices that would result in take of endangered species is prohibited by section 9 of the ESA, such actions do occur. NOAA Fisheries cannot conclude with certainty that any particular riparian habitat will be modified to such an extent that take will occur. However, given the patterns of riparian development in the action area and rapid human population growth of Benton and Franklin counties (26.6% and 31.7% respectively, from 1990-2000, U.S. Census Bureau), it is reasonably certain that some riparian habitat will be impacted in the future by non-Federal activities.

2.1.5 Conclusion

NOAA Fisheries has determined that the project does not jeopardize the continued existence of UCRS chinook and/or UCR steelhead.. We base this conclusion upon our review of the direct and indirect effects of the proposed action (including measures proposed by the action agency to minimize the risk and extent of effects) on the above listed species and their habitat. NOAA Fisheries evaluated these effects of the action in light of the status of the species, baseline conditions in the action area, and cumulative effects anticipated in the action area.. The effects of the action, when added to the effects from baseline conditions and cumulative effects, are unlikely to adversely influence the existing population trends or risks for listed salmonids. UCRS chinook and/or UCR steelhead.

2.1.6 Reinitiation of Consultation

This concludes formal consultation for the Leslie Groves Park and Howard Amon Park boat launch expansion and improvement projects. Consultation must be reinitiated if: (1) the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed (50 C.F.R. 402.16). To reinitiate consultation, the COE should contact the Habitat Conservation Division (Washington Branch Office) of NOAA Fisheries. Upon reinitiation, the protection provided by this incidental take statement, section 7(o)(2), becomes invalid.

2.2 Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened species without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct (50 C.F.R. 217.12). Harm is further defined as significant habitat modification or degradation that results in death or injury to listed species by "significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding, or sheltering" (50 C.F.R. 222.102). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or applicant carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and is not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary. They must be implemented by the action agency so that they become binding conditions of any grant or permit issued to the applicant as appropriate, for the exemption in Section 7(o)(2) to apply. The COE has a continuing duty to regulate the activity covered in this incidental take statement. If the COE fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. The take statement also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of Take Anticipated

As stated in Section 2.1.1, above, UCRS chinook and UCR steelhead use the action area for migratory purposes and possibly rearing. Because UCR steelhead are likely to be present in the action area at any time, and UCRS chinook are likely to be present in the action area during part of the year, incidental take of listed salmonids is reasonably certain to occur. As a general matter, take caused by the proposed action will be in the form of harm, which includes changes in habitat conditions causing behavioral changes that injure or kill listed salmonids. Other incidental take is likely to result in the form of increased predation because of the construction of new in- and over-water structure.

The amount of take from these causes is difficult, if not impossible, to estimate. In instances where the number of individual animals to be taken cannot be reasonably estimated, NOAA Fisheries uses a surrogate measure of extent of take. The surrogate should provide an obvious threshold which, if exceeded, provides a basis for reinitiating consultation.

This Opinion analyzes the effects that would result from adding approximately 117 cubic feet of in-water structure, 1,760 square feet of over-water structure, and covering about 458 square feet of benthic habitat in the action area. The effects of these activities on listed species will be minimized by restoring about 3,000 square feet of non-functional area to functioning riparian and benthic habitat by removing concrete debris and planting riparian vegetation. Despite the use of the best scientific and commercial data available, NOAA Fisheries cannot estimate the number of fish that would be injured or killed by these activities, but anticipates that the conservation measures described as part of the action will ensure that the numbers of fish taken will be low. Therefore, the extent of take authorized in this statement is that which would occur from the addition of 117 cubic feet of in-water structure, 458 square feet of decreased benthic habitat, and 1,760 square feet of additional over-water structure. Should any of these thresholds be exceeded during project activities, the reinitiation provisions of this Opinion apply.

2.2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize take of UCRS chinook and UCR steelhead. These RPMs reflect measures described as part of the proposed action in the BE and the foregoing Opinion. NOAA Fisheries has included them here to ensure that the COE is aware that the project description binds the permitee.

1. Minimize the likelihood of incidental take from boat docks and ramps by applying methods to avoid or minimize creating predator habitat.

2. Minimize the likelihood of incidental take from activities involving use of heavy equipment, vehicles, earthwork, site restoration, or that may otherwise involve in-water work or affect fish passage by applying methods to avoid or minimize disturbance to riparian and aquatic systems.

3. Minimize the likelihood of incidental take from erosion control activities requiring streambank and shoreline protection by using an ecological approach to bank protection and the best available bioengineering technology.

2.2.3 Terms and Conditions

The proposed action includes measures to reduce both the likelihood and amount of incidental take. To ensure the action agency understands these measures are mandatory, take minimization measures included as part of the proposed action, are restated in the Terms and Conditions provided below.

To comply with ESA Section 7 and be exempt from the prohibitions of Section 9 of the ESA, the COE must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These Terms and Conditions largely reflect measures described as part of the proposed action in the BE and the foregoing Opinion. NOAA Fisheries has included them here to ensure that the action agency understands that they are non-discretionary.

1. To implement Reasonable and Prudent Measure No. 1 (minimize predator habitat), the COE shall ensure that in addition to their proposed conditions:

    1.1 Pilings shall be limited in size and quantity to the minimum necessary to support dock structures.

    1.2 Grating will be rated at greater than 60% open space.

    1.3 White or light gray dock components will be used below the surface (flotation and pilings).

    1.4 All reflective dock components below the water surface (floats and the upper parts of the pilings) will be cleaned at least annually (prior to March 1) without chemicals such that the components remain bright and reflective through the spring out-migration of listed salmonids.

    1.5 Grated surfaces on the docks will not be used for storage or other purposes that would reduce natural light penetration through the structure.

    1.6 The entire surface of the gangways and/or walkways will be fully grated.

    1.7 All pilings and navigational aids, such as moorings, and channel markers, will be fitted with devices to prevent perching by piscivorus bird species.

2. To Implement Reasonable and Prudent Measure No. 2 (in-water work), the COE shall ensure that:

    2.1 The Contractor will develop and implement a site-specific spill prevention, containment, and control plan (SPCCP), and is responsible for containment and removal of any toxicants released. The Contractor will be monitored by the COE to ensure compliance with this SPCCP. The plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

        2.1.1 Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

        2.1.2 Practices to confine, remove and dispose of excess concrete, cement, and other mortars or bonding agents, including measures for washout facilities.

        2.1.3 A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

        2.1.4 A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

2.2 All discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water) will be treated as follows:

2.2.1 Facilities must be designed, built, and maintained to collect and treat all construction discharge water using the best available technology applicable to site conditions. The treatment must remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

2.3 Material removed during excavation will only be placed in locations where it cannot enter streams, wetlands or other water bodies.

2.4 The following erosion and pollution control materials shall be onsite:

2.4.1 A supply of erosion control materials (*e.g.*, silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.

2.4.2 An oil absorbing, floating boom is available on-site during all phases of construction. The boom must be of sufficient length to span the wetted channel.

2.4.3 All temporary erosion controls (*e.g.*, straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

2.5 All exposed or disturbed areas will be stabilized to prevent erosion.

2.5.1 Areas of bare soil within 150 feet of waterways, wetlands, or other sensitive areas will be stabilized by native seeding, mulching, and placement of erosion control blankets and mats, if applicable, but within 14 days of exposure.

2.5.2 All other areas will be stabilized quickly as reasonable, but within 14 days of exposure.

2.5.3 Seeding outside of the growing season will not be considered adequate nor permanent stabilization.

2.6 All erosion control devices will be inspected during construction to ensure that they are working adequately.

2.6.1 Erosion control devices will be inspected daily during the rainy season,weekly during the dry season.

2.6.2 If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.

2.6.3 Erosion control measures will be judged ineffective when turbidity plumes are evident in waters occupied by listed salmonids during any part of the year.

2.7 Sediment will be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground. Catch basins will be maintained so that sediment does not accumulate within traps or sumps.

2.8 Sediment-laden water created by construction activity will be filtered before it enters a stream or other water body. Silt fences or other detention methods will be installed as close as reasonable to outlets to reduce the amount of sediment entering aquatic systems.

2.9 Any hazardous materials spill will be reported to NOAA Fisheries.

2.9.1 In the event of a hazardous materials or petrochemical spill, immediate action shall be taken to recovery toxic materials from further impacting aquatic or riparian resources.

2.9.2 In the event of a hazardous materials or petrochemical spill, a detaileddescription of the quantity, type, source, reason for the spill, and actions taken to recover materials will be documented. The documentation should include photographs.

2.10 Vehicle and stationary power equipment refueling, staging, and hazardous materials.

2.10.1 Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 150 feet or more from any stream, water body, or wetland.

2.10.2 All vehicles operated within 150 feet of any stream, water body, or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operations.

2.10.3 All equipment operated instream must be cleaned before beginning operation below the OHWL to remove all external oil, grease, dirt, and mud.

2.10.4 Stationary power equipment (*e.g.*, generators, cranes) operated within 150 feet of any stream, water body, or wetland must be diapered to prevents leaks, unless otherwise approved in writing by NOAA Fisheries.

2.10.5 No auxiliary fuel tanks will be stored within 150 feet of the OHWL.

2.11 Boundaries of the clearing limits associated with site access and construction will be flagged to prevent ground disturbance of riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary.

2.12 Boulders, rock, woody materials, and other natural construction materials used for the project must be obtained from outside of the riparian area.

2.13 All project operations, except efforts to minimize storm or high flow erosion, will cease under high flow conditions that may result in inundation of the immediate work area.

2.14 All work will be done in the work window between November 15 and February 28.

3. To implement Reasonable and Prudent Measure No. 3 (erosion control), the COE shall ensure that:

3.1 All damaged areas will be restored to pre-work conditions. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation.

3.2 All exposed soil surfaces, including construction access roads and associated staging areas, will be stabilized at finished grade with mulch, native herbaceous seeding, and native woody vegetation. Areas requiring revegetation must be replanted between October 15 and April 15 with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs, and trees.

3.3 No herbicide application will occur within 300 feet of any stream channel as part of this action. Mechanical removal of undesired vegetation and root nodes is permitted.

3.4 No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.

3.5 Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

3.6 Plantings will be planted in the first planting season following dock construction, and must achieve 100% survival after one year, and 80% survival or 80% ground cover after five years (including both plantings and natural recruitment). If the success standard has not been achieved after five years, the COE will submit an alternative plan to NOAA Fisheries. The alternative plan will address temporal loss of function for the five years.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));

- NOAA Fisheries must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook; coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in Section 1.3 and 1.4 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

3.4 Effects of Proposed Action

As described in detail in Section 2.1.3 of this document, the proposed action may result in short- and long-term adverse effects to a variety of habitat parameters.

1. Temporary increases in suspended sediment as a result of instream project activities.

2. Temporary risk of contamination of waters through the accidental spill or leakage of petroleum products from heavy equipment.

3. Temporary reduction of riparian vegetation through removal of native plant species.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action would adversely affect designated EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NOAA Fisheries understands that the conservation measures described in the BE will be implemented by the COE, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. To minimize the adverse effects to designated EFH for Pacific salmon (suspended sediment, contamination of waters, and riparian habitat alteration), NOAA Fisheries recommends that the COE implement Terms and Conditions 2 and 3 as described in Section 2.2.3 of this document.

3.7 Statutory Response Requirement

Pursuant to the MSA (§305(b)(4)(B)) and 50 C.F.R. 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 C.F.R. 600.920(k)).

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